AMERICAN ANNALS OF THE DEAF

FOUNDED 1847

Official Organ

Conference of Executives of American Schools for the Deaf

FOUNDED 1868

Convention of American Instructors of the Deaf

FOUNDED 1850

POWRIE VAUX DOCTOR, Ph.D.
Editor

WILLIAM C. STOKOE, JR., Ph.D.
Associate Editor

Under the Direction of the Executive Committee of the Conference

EDMUND B. BOATNER	Connecticut, 1957
Chairman	
MARSHALL S. HESTER	New Mexico, 1957
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EDWARD M. TWITMYER	Pennsylvania, 1958
ARCHIE F. LEARD	Saskatchewan, Canada, 1959
CARL F. SMITH	North Dakota, 1959

MARCH, 1957

Volume 102 **Number 2**

THE CONFERENCE OF EXECUTIVES OF AMERICAN SCHOOLS FOR THE DEAF

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Secretary.....William J. McClure, Tennessee
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Secretary, Committee on Certification.....Richard O. Brill, California

The Conference of Executives of American Schools for the Deaf, originally the Conference of Superintendents and Principals of American Schools for the Deaf, was founded in 1868 and subsequently incorporated under the laws of the State of Maryland in 1931. The Conference is an organization of the executive heads of schools for the deaf in the United States and Canada, and has for its object "to promote the management and operation of schools for the deaf along the broadest and most effective lines and to further and promote the general welfare of the deaf."

THE CONVENTION OF AMERICAN INSTRUCTORS OF THE DEAF

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The Convention of American Instructors of the Deaf, founded in 1850 and incorporated by act of Congress in 1[illegible], is an organization of educators of the deaf in the United States and Canada with the general object of "promotion of the education of the deaf on the broadest, most advanced, and practical lines," and for that purpose "to secure the harmonious union in the organization, of all persons engaged or engaged in educating the deaf in America."

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AMERICAN ANNALS OF THE DEAF

Vol. 102 March, 1957 No. 2

Conference of Executives of American Schools for the Deaf

29th Regular Meeting

Tennessee School for the Deaf, Knoxville, Tennessee

June 22, 1957

E. B. BOATNER, *President*
Superintendent, American School for the Deaf
West Hartford, Conn.

SATURDAY, JUNE 22, 1957

9:00 A.M. Invocation

Address of Welcome—William J. McClure, Supt., Tennessee School for the Deaf

President's Address—Dr. E. B. Boatner, Supt., American School for the Deaf, Hartford, Conn.

Report on the *American Annals of the Deaf*—Dr. Powrie V. Doctor, Editor

Paper—Training Teachers; In-service Training of Beginning Teachers and Further Training of Experienced Teachers—Ben E. Hoffmeyer, Supt., North Carolina School for the Deaf

Information on Gallaudet College—Dr. Leonard M. Elstad, President of Gallaudet College

RECESS

Panel:

"What Can We Do to Enable Our Students to Achieve the Educational Level Which We Feel They Are Capable of Reaching?"

Leader—James H. Galloway, Supt., Rochester School for the Deaf

Participants—J. G. Demeza, Supt., Ontario School for the Deaf
Edwart L. Scouten, Gallaudet College

Panel:

"How Can We Most Effectively Organize Our Day in the Residential School?"

Leader—Stanley D. Roth, Supt., Kansas School for the Deaf
Participants—C. Joseph Giangreco, Principal, Iowa School for the Deaf
Edward W. Reay, Supt., Idaho School for the Deaf
John G. Nace, Supt., Pennsylvania School for the Deaf

LUNCH—12:30

2:00 P.M.

Business Session
Minutes of the Mississippi Meeting
Treasurer's Report

Reports of Standing Committees

Executive Committee
Endowments—Charles M. Jochem, Supt.
New Jersey School for the Deaf
Legislation—Dr. Leonard M. Elstad, President
Gallaudet College
Public Relations—William J. McClure, Supt.
Tennessee School for the Deaf
Educational Research—Dr. Richard G. Brill, Supt.
California School for the Deaf
Riverside, Cal.
Statistics—Edward W. Tillinghast, Supt.
Arizona School for the Deaf
Teacher Training and Certification—Howard M. Quigley, Supt.
Minnesota School for the Deaf
Resolutions—Dr. Daniel T. Cloud, Supt.
New York School for the Deaf

Reports of Special Committees:

Captioned Films—Dr. E. B. Boatner, Supt.
American School for the Deaf
Endowment for Teacher Training—Roy G. Parks, Supt.
Arkansas School for the Deaf
Annals Study Committee—William J. McClure, Supt.
Tennessee School for the Deaf
Accrediting System of American Schools for the Deaf—
James H. Galloway, Supt.
Rochester School for the Deaf
Mentally Deficient Deaf Children—Bruce Siders, Supt.
Michigan School for the Deaf
Emotionally Disturbed Deaf Children—Lloyd A. Harrison, Supt.
Missouri School for the Deaf

Election of Officers:

CONFERENCE DINNER AT COUNTRY CLUB—6:30

Program: The Deaf Child with Other Handicaps—Dr. Helmer Myklebust, Northwestern University

Discussion Period
Social Hour

Convention of American Instructors of the Deaf

38th Biennial Meeting

Tennessee School for the Deaf, Knoxville, Tennessee

June 23–28, 1957

JAMES H. GALLOWAY, *President*
Superintendent, Rochester School for the Deaf
1545 St. Paul Street, Rochester 21, N. Y.

CONVENTION THEME—"A REVIEW OF TODAY: A VIEW OF TOMORROW"

PROGRAM

SUNDAY, JUNE 23, 1957

10:00–6:00 P.M.—Registration

8:00 P.M.—Opening Session

Mr. James H. Galloway, President, Presiding
Keynote Address: Dr. Andrew W. Holt, Vice-President, University of Tennessee

MONDAY, JUNE 24, 1957

SECTION ON LANGUAGE

Mildred Groht, L.H.D., Section Leader
Principal, Academic Dept., Lexington School for the Deaf, New York, N. Y., Presiding

Participants:

Powrie V. Doctor, Ph.D., Gallaudet College
Miss Alice Kent, Supervisor, Classes for the Deaf and the Hard of Hearing, East Cleveland, Ohio
Miss Mary E. Numbers, Teacher-in-Charge, Middle School, Clarke School for the Deaf
Miss Beatrice Ostern, Supervising Teacher, Lexington School for the Deaf
Miss Marian Quick, Supervising Principal, Western Pennsylvania School for the Deaf

9:00–10:00 A.M.—Language Workshop—Dr. Powrie V. Doctor*

* On Monday a class from the South Carolina School for the Deaf, Spartanburg, S. C., will participate in the workshop. On Tuesday and Thursday a class from the Tennessee School for the Deaf, Knoxville, Tenn., will take part. The oral method will be used on Monday and the simultaneous method on Tuesday and Thursday.

10:15–11:15 A.M.—Paper: "Language for Communication"—Miss Beatrice Ostern
Paper: "Conceptual Language Teaching"—Dr. Mildred Groht
Panel Discussion:
Miss Alice Kent
Miss Mary E. Numbers
Miss Marian Quick

SECTION ON VOCATIONAL TRAINING

Mr. Charles L. Brooks, Section Leader
Vocational Principal, New York School for the Deaf, White Plains, N. Y., Presiding

9:00—10:00 A.M.

10:15–11:15 A.M.

Paper: "Vocational Training Programs—Today and Tomorrow" Discussion
Paper: "Occupational Placement of the Deaf—Past, Present and Future" Discussion
Paper: "The Vocational Teacher's Position in the Education of the Deaf" Discussion

SECTION ON SPEECH

Miss Alyce Thomas, Section Leader
Supervising Teacher, California School for the Deaf, Riverside, California, Presiding

Participants:

Mr. Joseph Giangreco, Principal, Iowa School for the Deaf
Miss Margaret Gruver, Assistant Principal, Rhode Island School for the Deaf
Frank R. Kleffner, Ph.D., Assistant Director, Division of Speech Correction and Pathology, Central Institute for the Deaf
Miss Mary E. Numbers, Teacher-in-Charge, Middle School, Clarke School for the Deaf
Miss Marline Parish, Supervising Teacher, Primary Dept., Tennessee School for the Deaf
Mr. Lorin C. Staats, Jr., Assistant Professor of Special Education, University of Tennessee
Miss Eleanor Vorce, Academic Assistant Principal, Lexington School for the Deaf

1:15– 2:15 P.M.

A Review of Today; a View of Tomorrow in the Area of Speech
Keynote Address—Mr. Loren C. Staats

Paper: "The Tadoma Method of Teaching Speech"—Miss Margaret Gruver
Paper: "The Aphasic Child"—Dr. Frank R. Kleffner

2:30– 3:30 P.M.

Discussion of Questions on Speech—Moderator: Miss Eleanor Vorce

Panelists:

Mr. Joseph Giangreco
Dr. Frank R. Kleffner
Miss Mary E. Numbers
Miss Marline Parish
Mr. Loren C. Staats

SECTION FOR DEAF TEACHERS

Mr. David Mudgett, Section Leader, Teacher, Illinois School for the Deaf, Jackson, Illinois, Presiding

Participants:

Mr. Stanley Benowitz, Instructor in Science, Gallaudet College
Mr. Roy Holcomb, Teacher, Tennessee School for the Deaf
Mr. J. M. Smith, Teacher, Tennessee School for the Deaf

1:15– 2:15 P.M.

Paper: "Science—Stepchild of the Curriculum" (Guest speaker to be announced)
Discussion led by Mr. Stanley Benowitz
Exhibit of classroom projects in science by Mr. Roy Holcomb

2:30– 3:30 P.M.

Paper: "The Role and Future of the Deaf Teachers' Section"
Paper and discussion led by Mr. J. M. Smith

SECTION FOR DAY SCHOOL TEACHERS

Mr. Dwight W. Reeder, Section Leader
Principal, Bruce Street School, Newark, New Jersey, Presiding

3:45– 4:45 P.M.

General Meeting—Mr. Dwight W. Reeder in charge

TUESDAY, JUNE 25, 1957

SECTION ON READING

Miss June E. Newkirk, Section Leader
Teacher, Arizona School for the Deaf, Tucson, Arizona, Presiding

Participants:

Miss Ruth Clements, Teacher, California School for the Deaf, Riverside
Powrie V. Doctor, Ph.D., Gallaudet College

Mrs. Laura Crosby, Teacher, Wisconsin School for the Deaf
Miss Beatrice Ostern, Supervising Teacher, Lexington School for the Deaf

9:00–10:00 A.M.

Language Workshop—Dr. Powrie V. Doctor

10:15–11:15 A.M.

Panel Discussion on "The Problem of Severe Retardation in Reading (among the gifted deaf)"

Paper One: "Early Symptoms of Reading Difficulties"—Miss Ruth Clements

Paper Two: "Can Retardation Be Prevented?"—Miss Beatrice Ostern

Paper Three: "Meeting the Needs of the Retarded Teen-Age Reader"—Mrs. Laura Crosby

Note:

(1) Copies of the revised reading list compiled by Mrs. Laura Crosby and associates in the Wisconsin School for the Deaf will be distributed to those who attend the section meeting.

(2) There will be a display of suitable materials for the retarded teen-age reader.

SECTION ON MULTIPLE HANDICAPS

Miss Mabel Talbot, Section Leader
Principal, Deaf and Blind Dept., Iowa School for the Deaf, Council Bluffs, Iowa, Presiding

Participants:

Sara Stinchfield Hawk, Ph.D., Speech Therapist, Glendale, California
Mr. Edward L. Scouten, Gallaudet College

9:00–10:00 A.M.

Address: "The Rochester Method"—Mr. Edward Scouten
Questions and discussion from the floor

10:15–11:15 A.M.

Address: "Moto-Kinesthetic Speech Therapy and Action Poems"—Dr. Sara Stinchfield Hawk

3:45– 4:45 P.M.

Demonstrations with suitable pupils—Dr. Sara Stinchfield Hawk

SECTION ON AUDITORY TRAINING

Mr. Lloyd A. Harrison, Section Leader
Superintendent, Missouri School for the Deaf, Fulton, Missouri Presiding

Participants:

Robert Frisina, Ph.D., Director, Hearing and Speech Center, Gallaudet College

Cornelius P. Goetzinger, Ph.D., Audiologist, Dept. of Hearing and Speech, University of Kansas Medical Center, Kansas City, Kansas

1:15– 2:15 P.M.

2:30– 3:30 P.M.

Theme: "Auditory Training: For Whom, How Long, and How"

Discussants:

Dr. Robert Frisina
Dr. Cornelius P. Goetzinger

SECTION ON SECONDARY EDUCATION

Irving S. Fusfeld, Litt.D., Section Leader
Past Vice-President, Gallaudet College, Washington, D. C., Presiding

Participants:

Mr. Paul C. Bird, Supervisor of Hearing Conservation, Florida School for the Deaf and the Blind

Mr. Mervin D. Garretson, Head Teacher, Montana School for the Deaf and the Blind

Miss Harriet F. McLaughlin, Principal, Junior High Public School 47, New York City

Mr. Edward L. Scouten, Gallaudet College

1:15– 2:15 P.M.

Topic: "High School Work in Our Schools for the Deaf"
General Review—Dr. Irving S. Fusfeld
Paper: "What Schools in the East Are Doing"—Mr. Edward L. Scouten
Paper: "What Schools in the West Are Doing"—Mr. Marvin D. Garretson
Paper: "What Schools in the South Are Doing"—Mr. Paul C. Bird

2:30– 3:30 P.M.

Summarization of the first hour—Dr. Irving S. Fusfeld
Paper: "How the Day School Functions in the High School Area"—Miss Harriet F. McLaughlin
General Discussion

Entertainment—Tuesday Evening, 7:30 P.M.

Moving Pictures: "Susan's Wonderful Adventure"
"Eyes That Hear"
"Thursday's Children"

WEDNESDAY, JUNE 26, 1957

An all day trip through the Smokies including the beautiful and primitive Cades Cove Loop. Lunch will be served to those going by bus and in the evening there will be a smorgasbord, dancing and entertainment in the new Civic Center at Gatlinburg. Bus trip, lunch, smorgasbord, and entertainment, all for $7.50

THURSDAY, JUNE 27, 1957

SECTION FOR PRINCIPALS AND SUPERVISING TEACHERS

Miss Julie McDermott, Section Leader
Supervising Teacher, South Carolina School for the Deaf, Spartanburg, South Carolina, Presiding

Participants:

Powrie V. Doctor, Ph.D., Gallaudet College
Miss Margaret H. Gruver, Assistant Principal, Rhode Island School for the Deaf
Mrs. Carolyn Hyatt, Teacher, South Carolina School for the Deaf
Mr. Howard M. Quigley, Superintendent, Minnesota School for the Deaf

9:00–10:00 A.M.

Language Workshop—Dr. Powrie V. Doctor

10:15–11:15 A.M.

Paper: "The Teacher's Part in the Building of and the Using of an English Course of Study"—Mrs. Carolyn Hyatt
Paper: "The Supervising Teacher's Part in the Building of and the Using of an English Course of Study"—Miss Margaret H. Gruver
Paper: "The Administration's Part in the Building of and the Using of an English Course of Study"—Mr. Howard M. Quigley
Panel discussion with audience participation

SECTION ON PRESCHOOL AND KINDERGARTEN

Miss Marjorie E. Magner, Section Leader
Teacher-in-Charge of the Lower School, Clarke School for the Deaf, Northampton, Mass., Presiding

Participants:

Miss Alice Kent, Supervisor, Classes for the Deaf and the Hard of Hearing, E. Cleveland, Ohio
Mrs. Alice R. Monaghan, Central Institute for the Deaf
Miss Marguerite Stoner, Supervising Teacher, John Tracy Clinic
Miss Eleanor Vorce, Academic Assistant Principal, Lexington School for the Deaf

9:00–10:00 A.M.

Paper: "Social Activities"—Mrs. Alice R. Monaghan
Paper: "Speech Perception"—Miss Eleanor Vorce
Paper: "Auditory Training"—Miss Alice Kent
Paper: "Speech Production"—(Member to be announced)

10:15–11:15 A.M.

Panel Discussion: Parent-Teacher Relation—Miss Marguerite Stoner and two parents
Questions from the floor

SECTION ON RESEARCH

Louis M. DiCarlo, Ph.D., Section Leader
Executive Director, Gordon D. Hoople, Hearing and Speech Center, Syracuse University, Syracuse, New York, Presiding

Participants:

Irving S. Fusfeld, Litt.D., Past Vice-President, Gallaudet College
Robert Goldstein, Ph.D., Research Associate, Central Institute
Clarence V. Hudgins, Ph.D., Director of Research, Clarke School for the Deaf
Franz J. Kallmann, M.D., Research Scientist, Dept. of Medical Genetics, New York State Psychiatric Institute, Columbia University
Helen S. Lane, Ph.D., Principal, Central Institute for the Deaf
James McCarthy, Ph.D., Research Assistant, Institute for Research on Exceptional Children, University of Illinois
John D. Rainer, M.D., Associate Research Scientist, Dept. of Medical Genetics, New York State Psychiatric Institute, Columbia University

1:15– 2:15 P.M.

Paper: "The Application of a Theory of Communication to the Problems of the Deaf and the Hard of Hearing and Implications for Research"—Dr. James McCarthy
Paper: "Factors in Lipreading as Determined by the Lipreader"—Dr. Irving S. Fusfeld
Paper: "A Comparison of the Rhythmic Responses of Deaf and Normal Children"—Dr. Clarence V. Hudgins

2:30– 3:30 P.M.

Paper: "A Comparative Study of Some Neurological Factors in Deaf and Aphasic Children"—Dr. Robert Goldstein
Paper: "Problems of Interpretation of Performance Test Norms Between the Ages of Nine and Twelve"—Dr. Helen S. Lane
Paper: "A Program for Studying Problems of Mental Health among the Deaf in New York State"—Dr. Franz J. Kallmann & Dr. John D. Rainer

Paper: "An Experimental Study of the Effects of Hearing One's Own Voice among Children with Impaired Hearing"—Dr. Louis M. DiCarlo

SECTION ON HEALTH AND PHYSICAL EDUCATION

Mr. Raymond Butler, Section Leader
Head Coach, Texas School for the Deaf, Austin, Texas, Presiding

Participants:

Mr. E. Conley Akin, Director of Physical Education, Tennessee School for the Deaf
Mr. John Kubis, Coach, North Carolina School for the Deaf
Mrs. Patsy R. Smith, Instructor of Physical Education, Tennessee School for the Deaf
Mr. Frank Turk, Instructor of Physical Education, Kendall School

1:15– 2:15 P.M.

Paper: "Boys' Physical Education at the Tennessee School for the Deaf"—Mr. E. Conley Akin
Paper: "Girls' Physical Education at the Tennessee School for the Deaf"—Mrs. Patsy R. Smith

2:30– 3:30 P.M.

Paper: "Intramurals: Their Place in a School for the Deaf"—Mr. Frank Turk
Football Clinic—Mr. John Kubis

SECTION ON VOCATIONAL TRAINING
(2nd Session)

Mr. Charles L. Brooks, Section Leader
Vocational Principal, New York School for the Deaf, White Plains, N. Y., Presiding

1:15– 2:15 P.M.

2:30– 3:30 P.M.

Paper: "Industrial Requirements for Young Deaf People"
Discussion
Paper: "Guidance in the Vocational Training Program"
Discussion
Paper: "Teaching Techniques in the School Shop"
Discussion

8:00– 9:30 P.M.

Business Meeting, Convention of American Instructors of the Deaf

FRIDAY, JUNE 28, 1957

SECTION ON SOCIAL STUDIES

Mr. Paul C. Bird, Section Leader
Supervisor of Auditory Training, Florida School for the Deaf and the Blind, St. Augustine, Florida, Presiding

Participants:

Lawrence O. Haaby, Ph.D., Professor of Education, University of Tennessee
Mrs. Emelie Kalal, Social Studies Teacher, Florida School for the Deaf

9:00–10:00 A.M.

Paper: "A Review of Yesterday"—Mr. Paul C. Bird
Paper: "What's Happening in the Social Studies"—Dr. Lawrence O. Haaby

10:00–11:15 A.M.

Paper: "A View of Tomorrow"—Mrs. Emelie Kalal
Open discussion of the preceding papers with audience participation

SECTION ON VISUAL EDUCATION

Mr. E. LeRoy Noble, Section Leader
Supervising Teacher, Advanced Dept., California School for the Deaf, Berkeley, California, Presiding

9:00–10:00 A.M.

Demonstration and Lecture: "Enriched Learning through Meaningful Educational Film"—Mr. E. LeRoy Noble

10:15–11:15 A.M.

(Program to be announced)

Arrangements for interpreters are being made by: Mr. Kenneth F. Huff, Assistant Superintendent, Nebraska School for the Deaf, Omaha 3, Nebraska

Mr. Roy K. Holcomb, Tennessee School for the Deaf, Knoxville 20, Tennessee, is in charge of displays and exhibits

Program Chairman
Edward R. Abernathy, Ph.D., Supt.
Ohio School for the Deaf
First Vice-President,
The Convention of American Instructors of the Deaf

Group and Wearable Hearing Aids in a Residential School for the Deaf

JOSEPHINE PRALL, M.A.
Hearing Consultant, South Carolina School for the Deaf, Spartanburg

PROBABLY no other phase of the education of the acoustically handicapped child has received so much attention in recent years as has the use of electronic amplification. A review of current literature reveals the increased emphasis on auditory training in all types of educational programs. The philosophy of most educators of the deaf today is based on the assumption that, until proven otherwise, every auditorially-handicapped child has a hearing potential which must be developed. An index of the vast increase in the number of group hearing aids and wearable hearing aids in use in residential schools alone over the past six years is provided by a comparison of the following statistics taken from the January, 1950 and January, 1956 issues of the *American Annals of the Deaf:*

Year	*No. Schools Listed*	*Total No. Pupils*	*No. Pupils Using Individual Aids*	*No. Pupils Using Group Aids*
1950	73	13,376	1,472	3,215 (p. 124)
1956	72	14,501	3,741	8,155 (p. 173)

The purpose of this paper is to define and clarify the terms, "group hearing aid" and "wearable hearing aid" and to delineate the uses of each type of instrument with special reference to the residential school.

DEFINITION OF TERMS

"Group hearing aid" appears to be the term most commonly used in current literature to designate the large stationary amplification units used in classrooms and clinics to accomodate several children at one time. A distinction is sometimes made, however, between group hearing aids and auditory training units. This difference has been well clarified by the authors of the recently published book, *Hearing Therapy for Children.* The group hearing aid is described by the authors as an instrument made up of one or more microphones, an amplifier, a number

of earphones or headsets, and sometimes a loudspeaker. Individual volume controls are usually provided for each listener. Auditory training units incorporate all the features of group aids plus a record player, loudspeaker, and attachments for radio or television sets. These modern units have been so designed that sounds of high intensity may be delivered to the listener without causing pain or discomfort by means of automatic volume control called compression amplification. A greater fidelity of response is also achieved with the modern auditory training units than with most group systems.[1]

Between the auditory training units and the individual aid in size and use is the desk or table model hearing aid, consisting of a microphone, amplifier, and one or two sets of headphones. It is portable and well-suited to home instruction. Some of these instruments are plugged into electrical outlets, while others operate on batteries.

The wearable hearing aid, often called the individual aid, is worn on the person. It consists of a microphone, an amplifier, one or two batteries, a cord, an air receiver (earphone), or, in a small minority of cases, a bone conduction receiver and headband. A volume control and tone control permit the user to adjust reception to his individual needs. Until about three years ago most wearable aids employed vacuum tube circuits which required an A battery and a B battery. The vacuum tube now has been superseded by the transistor which requires only low voltage, A, batteries.

Amplification for Preschool Users

The benefits to be gained from providing preschool children with amplification are obvious to all who are familiar with the education of the child with impaired hearing. The preschool years are the critical period not only from the standpoint of speech and language development but also from the standpoint of adjustment to a hearing world. The use of a hearing aid, whether group or individual, is one means of helping the child to achieve the skills of communication and make a better adjustment to

[1] Alice Streng *et al.*, *Hearing Therapy for Children* (Boston: Grune and Stratton, 1955), pp. 136ff.

his environment. In the writer's opinion initial training with an auditory training unit is advisable if the child is fortunate enough to be able to attend a preschool class or clinic where such facilities are available. Fitting a young child with a wearable aid presupposes a reasonably accurate evaluation of hearing loss and an intelligent orientation of the child by the parent or preschool teacher. The desk or table model aid mentioned above is excellent for home instruction, but it does imply some "know-how" and perseverance on the part of the parents. The use of amplification with the preschool child does not, however, lie within the scope of this paper as we are concerned primarily with those children who enter the residential school without having had the benefit of previous auditory experience through use of a hearing aid.

Group Aids in a Residential School

At the South Carolina School for the Deaf the group hearing aids are used for three primary purposes: (1) To aid in the evaluation of hearing loss in our preparatory groups. (2) To provide auditory training in preparation for use of a wearable aid. (3) To facilitate the teaching of speech, speechreading, language, reading, and other school subjects. (The group hearing aid program is under the direction of Miss Julie McDermott, Supervising Teacher.)

Our beginning class consists generally of six-year-olds, who are entering school for the first time. The majority of first year pupils have had no previous experience with auditory training. The classroom used by our beginners is equipped with a compression amplification auditory training unit. During the first few weeks of school each child is taught how to adjust the volume control to suit his own particular needs. This is often a difficult procedure for three reasons:

(1) Accurate audiograms are not always available at this age level to aid the teacher's judgment in setting the volume controls.

(2) Some children with moderately severe losses cannot at first tolerate intensity great enough for good discrimination. With these cases the level of tolerance for sound must gradually be developed over a period of time.

(3) Some children, on the other hand, tend to use a great deal more volume than is necessary for their particular loss. This group must be trained to use the minimum amount of power essential to their needs.

To teach the child awareness of sound we begin with gross sounds and soundmakers such as bells, whistles, crickets, horns, and the like. When the child has learned to recognize the presence or absence of gross sounds, exercises in listening for voice are introduced. Babbling exercises, humming, and long vowels given in high and low pitch are presented in the initial training period. Animal sounds are also introduced early in the year.

After the child has had this training, we find that he gives a much more reliable response to the audiometric test than he does when he first enters school. Training with the group instrument, therefore, aids us in the evaluation of the child's hearing loss. His response to the group aid also serves as a useful criterion in the selection and fitting of a wearable aid.

Following the work in the discrimination of gross sounds and differentiation of low and high pitch the teacher introduces speech sounds, proceeding gradually from simple one and two-syllable words selected from the child's vocabulary to more difficult types of discrimination such as work with vowels and consonants. Many of our children do not have sufficient residual hearing to achieve fine speech discrimination; nevertheless some of this group may learn to discriminate among words and phrases through differentiation of the pattern of rhythm and inflection. All of our classes through the fourth grade level are given two twenty-minute periods of basic auditory training daily and nothing is allowed to interfere with this work.

The third objective of our group hearing aid program as stated above is to facilitate the teaching of speech, language, and other school subjects. Our pupils wear their headphones throughout the day with the exception of occasional periods of written work.

The advantages accruing to the group with residual hearing are certainly obvious. Even in the cases of the profoundly deaf children we have found that speech perception improves when lipreading is supplemented with

amplification through the compression units. Amplification has been an invaluable aid to this group in achieving improved inflection and rhythm in their speech patterns.

Wearable Aids in Residential School

A program for the selection and use of wearable hearing aids at the South Carolina School has been developed by the writer during the past three years. This program will be outlined in brief.

Candidates for wearable hearing aids are selected on the basis of audiometric test findings, recommendation of the teacher, response to the group hearing aid program, and previous performance with a wearable aid in the case of those children fitted with instruments prior to the fall of 1953. After a child has been tested, examined by the school otologist, and provided with his own earmold, he embarks on a program of intensive training with wearable aids. The school has a library of twenty transistor aids which have been consigned by leading hearing aid companies. From this library the hearing consultant selects the instruments that are suited to the child's particular pattern of hearing loss. Each one of the aids recommended is loaned to the pupil for a period of a week or longer, if necessary, to be used throughout the school day. The child reports to the hearing consultant at least twice during the period he is using each aid, for auditory training and for an evaluation of his response with that particular instrument.

The basic work in auditory training has been presented to the child over the group hearing aid in the classroom. It is our experience that children who have had auditory training with a good group aid are better prepared to use a wearable aid than are those who have not had this opportunity.

Auditory training with the wearable aids includes the following:

(1) Discrimination of gross sounds.

(a) Sounds of everyday life such as coughing, clapping, laughing, ringing an alarm clock, banging a door, running water, etc.

(b) Instruments and soundmakers such as a horn, snapper, tambourine, cowbell, sleigh bells, triangle, etc.

(c) Recordings of sounds made by various animals.[2]

(d) Recordings of instruments and soundmakers.[2]

(e) Recordings of sounds of everyday life such as a train whistle, airplane, vacuum cleaner, doorbell, etc.[2]

(f) Recordings of band and orchestra selections.

(2) Discrimination of the sounds of speech.

(a) Word discrimination based on Utley's book, *What's Its Name?*[3]

(b) Vowel and consonant discrimination based on Utley's book cited above and *Auditory Training for the Deaf* by Whitehurst and Monsees.

(3) Connected speech.

(a) Expressions and sentences from *Auditory Training for the Deaf.*[4]

(b) General questions.

(c) Picture descriptions.

(d) News items.

(e) Nursery rhymes.

(f) Recording of *My Favorite Three Bears* by Mildred Howden.[5]

The length of the training period varies with the individual pupil, depending on his age, previous training, and degree of loss. In some cases training may be continued for several months before an aid is recommended; in other cases it may take only a few weeks. Since we have not had the facilities for objective evaluation of hearing aid performance, we have based our final selection on the

[3] Jean Utley, *Auditory Training Album* to accompany *What's Its Name?* University of Illinois Press; also distributed by Maico Co., Inc., Minneapolis, Minn.

[3] Utley, *What's Its Name: A Guide to Speech and Hearing Development*, Urbana, 1950.

[4] Mary Wood Whitehurst and Edna K. Monsees, *Auditory Training for the Deaf*, Washington: The Volta Bureau, 1952.

[5] Mildred Howden, *My Favorite Three Bears* (record), Washington: The Volta Bureau, 1954.

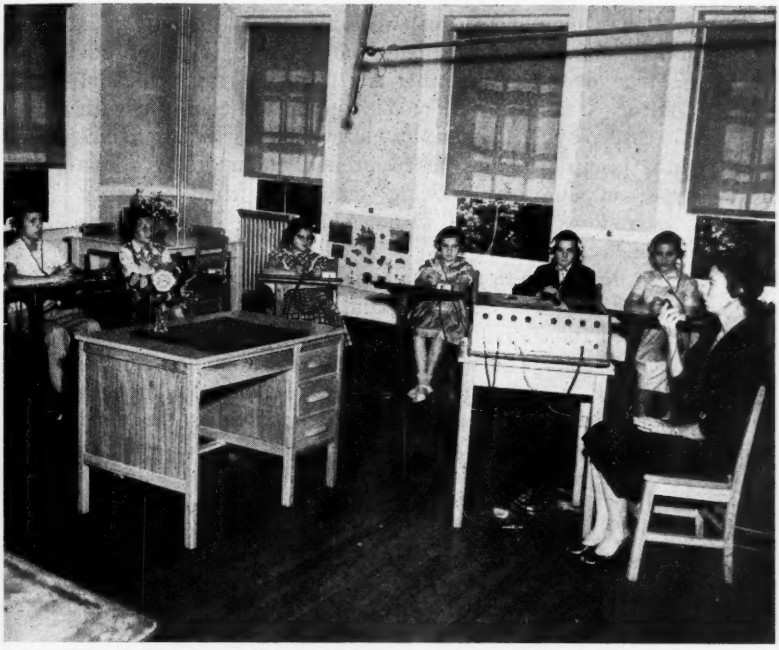
Preparatory II Class Using Wearable Hearing Aids for Classroom Instruction

child's responses with the various instruments in everyday situations and the results of our training program. The equipment for speech reception testing and hearing aid evaluation has been purchased by the school, however, and will be installed within the next year.

The aid recommended is bought by the parents if they are financially able to do so; in the event that they are not, an application is filed with the State Department of Education for the necessary funds.

When the child finally receives his own aid, he is given instructions for its operation and maintenance and charged with full responsibility for it, although periodic checks are made by the hearing consultant. He continues to have auditory training with his own aid for as long as it is indicated.

After the child has been fitted with his own aid the choice is left to him whether to use his own instrument or the



Second Grade Pupils Using Group Hearing Aid for Classroom Instruction

group hearing unit while in the classroom. He is entirely on his own so far as using the aid outside the classroom is concerned. About half of the group who own their own aids use them consistently throughout the day; the remainder of the group use their instruments for classroom work, and outside the classroom for special occasions such as TV programs, movies, chapel programs, etc.

Group Aids vs. Wearable Aids

Our experience has led us to believe that the modern auditory training unit offers a number of advantages over the wearable aid from the standpoint of design and performance. The group units are capable of delivering higher fidelity and a greater amount of power without distortion than the small individual aids. Present-day group aids are equipped with several microphones which are certainly more accessible to the teacher's voice than

are the microphones of wearable units. Group aids provide binaural headphones which afford another advantage over the wearable aid from the standpoint of auditory training. The modern group aid equipped with a record playing unit and radio or TV attachments facilitates group listening to recordings, radio, and various types of auditory training materials. High intensity of sound may be used without disturbing other persons in the environment.

We would like to mention one specific aspect of auditory training in which we have found the group aid to be superior to the individual aid. It has been our experience that the child who begins his auditory training with the group aid is easily taught to use the minimum amount of power essential for discrimination; whereas the child who begins his training with the wearable aid tends to use more power than is necessary.

After the child has been graduated to the wearable aid we feel that the choice should be left to him whether to use his own aid or the group aid while he is in the classroom. We would make an exception, however, in the case of those children with severe or moderately severe impairment. In view of the superior power output of the auditory training unit, we feel that these children should be encouraged to use the group headphones at least for the greater part of the school day, but by no means would we insist on it. The majority of our pupils prefer their own individual aids to the group aids. Either the child becomes accustomed to his own aid and actually prefers it or the idea of using his own instrument is psychologically important to him. The convenience of the wearable aid may also enter into the child's preference.

Use of the wearable aids outside the classroom is constantly encouraged, but not compelled. The function of the hearing aid to help the child communicate with others is clearly recognized. With the severely deaf child the aid may serve as an adjunct to speechreading, even though he may not be able to discriminate the sounds of speech through hearing alone. The role of non-speech sounds is also important. It is only through audition that the child will perceive the promiscuous sounds of every day

life which are so important in the development of concepts. The auditory impression, even though weak and distorted, of such common sounds as a radio, train, vacuum cleaner, lawn mower, doorbell, a dog's bark, or a bird's song will contribute immeasurably to his language development. The meaning of such words as "rumble," "bark," "rattle," "clatter," "ring," "buzz," and "chirp" can never be presented as forcefully to a child through the medium of reading, speechreading, and pictures as it can through auditory sensation.

The child's success with a hearing aid after school hours is contingent, of course, on the attitude of his parents, houseparents, and others with whom he comes in contact.

Summary and Conclusion

The terms, "group hearing aid" and "wearable hearing aid" have been defined. The various uses of each type of instrument have been described, with special reference to the residential school. Advantages and limitations of each have been presented.

A effective hearing aid program for any residential school would include the following features:

(1) Auditory training with a good group unit for all pupils enrolled.

(2) An adequate program of hearing aid selection and fitting for those children who have been found to benefit from amplification.

(3) Use of group aids for classroom instruction throughout the school.

(4) Constant daily use of the wearable aids, especially outside the classroom.

(5) Trained personnel for giving auditory training and for selecting and fitting wearable aids.

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New York State Association of Educators of the Deaf Convenes in Rochester

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THE New York State Association of Educators of the Deaf, a newly formed organization, held its first meeting at the Rochester School, Rochester, New York, on Friday and Saturday, October 26 and 27. About 200 teachers and administrators attended; about 90 per cent of the entire faculties and administrations of the seven residential schools in New York State.

Registration began at 1 P.M. on Friday and continued simultaneously with a coffee hour and tours of the campus until the banquet in the evening.

Two hundred and seven persons attended the banquet. Among the guests were Mrs. F. Ritter Shumway, President of the Board of Directors; Dr. Leonard M. Elstad, President of Gallaudet College and Mrs. Elstad; Mrs. Daniel T. Cloud and Mrs. James H. Galloway; Dr. E. Burke Boatner, President of the Conference of Executives of American Schools for the Deaf; Mr. William L. Vick, Treasurer of the Board of Directors; Mr. Joseph J. Endres, retired Chief of the Bureau for Handicapped Children; and Mr. Anthony J. Pelone, recently appointed Chief of the Bureau. Mr. Kendall D. Litchfield, first president of the Association, presided at the banquet as well as at the subsequent sessions.

A handsome solid silver cigarette box, appropriately inscribed, was presented to Mr. Endres by Dr. O'Connor on behalf of the residential schools in recognition of Mr. Endres' outstanding service to handicapped children of New York State for more than a quarter of a century.

After the banquet a business meeting was held in the school auditorium at which the Constitution was approved as amended and the following officers, delegates and alternate delegates were elected:

Officers

PRESIDENT—Miss Barbara Griffin, Rochester School
VICE PRESIDENT—Charles L. Brooks, New York School
SECRETARY—Mrs. Lorette Turpen,
Central New York School
TREASURER—Miss Mary Sheahan, St. Joseph's School

Delegates and Alternate Delegates

ST. MARY'S—John Rybak, Sebastian Rosica
ROCHESTER—Mrs. Rhea Poppink, Samuel Railing
CENTRAL NEW YORK—Mrs. Stella Hadlock,
Mrs. Hazelene Sparks
MILL NECK—Miss Amelia Boos, Miss Adele Brunjes
LEXINGTON—Miss Agnes Ness, Miss Jane Pearce
NEW YORK—Louis Fant, Miss Delores Mona
ST. JOSEPH'S—Miss Elizabeth Lynam

On Saturday morning from nine to ten o'clock Association members listened with keen interest to a stimulating talk by Dr. Raymond Carhart of the School of Speech at Northwestern University. He is president-elect of the American Speech and Hearing Association. Dr. Carhart emphasized that while the transistor must be considered a modern miracle, its use in hearing aids has rendered them inferior in performance to the vacuum tube aids of five or even ten years ago. He also pointed out that binaural hearing, so essential in the localization of sound and in the discrimination of conversation from the usual background noise, is a long way off as far as wearable aids are concerned. He regarded it as a serious limitation that modern wearable aids do not as yet offer compression amplification.

Dr. Carhart discussed further implications of binaural hearing for the education of children with severely impaired hearing and told about new research studies of the hearing process itself, presently being carried on at Northwestern University, which offer the hope of a better understanding of the use of amplified sound.

At. 10:15 the teachers broke up into five workshop groups to discuss subjects previously assigned, as follows:

MILL NECK SCHOOL

Opportunities for Growth of a Preschool Child
The Emotional Life of the Young Deaf Child

LEXINGTON SCHOOL

An Integrated Program for the Primary

CENTRAL NEW YORK SCHOOL

The Problem of Speech Motivation at the Intermediate Level

ST. MARY'S SCHOOL

Meeting the Need of Vocational Training for the Deaf

ROCHESTER SCHOOL

Adjusting the Curriculum (advanced department) in Terms of Pupils' Needs

At eleven-thirty teachers re-assembled in the Auditorium where the leader of each workshop group presented a summary of the discussion and made recommendations for next year's program. The conference closed after lunch on Saturday.

Much interest and enthusiasm were evident throughout the two-day program and all expressed themselves as being very much in favor of annual meetings of the Association. The Association will meet next year at the New York School in White Plains.

Classified Advertising

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Wanted: Due to expanding program will need two trained teachers in September for position in oral day school for the deaf. Write The Tucker-Maxon Oral School, 2860 S. E., Holgate Blvd., Portland 2, Oregon.

A Study of the Visual Memory of Deaf and Hearing Children*

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Assistant Professor of Speech and Audiology, Kent State University, Kent, Ohio

THERE is a slight but growing trend toward an interest in what might be termed the "specific" abilities of the deaf. In previous years the scant controlled research of the hypacusic has been largely limited to broad studies of intelligence and personality adjustment.[1] More recently several important researches have presented provocative findings in terms of performance on tests measuring relatively discrete abilities as opposed to overall functioning.[2, 3, 4, 5, 6, 7] The results of these studies give rise to the significant speculation that, contrary to earlier and empirical beliefs, the deaf, and more particularly deaf children should not be considered normal in all respects except hearing. There is an increasing conviction that there are other real differences between the deaf and the hearing child and that these differences may have pertinence with respect to the education of the deaf youngster.

The present study reports an investigation of the visual memory of deaf children as compared with the visual memory of hearing children. It was hypothesized that

* The writer is indebted to Dr. Helmer R. Myklebust, Northwestern University, for invaluable guidance in this investigation.

[1] Stanley Berlinsky, "Measurement of the Intelligence and Personality of the Deaf: A Review of the Literature," *Journal of Speech and Hearing Disorders*, XVII (1952), 39–54.

[2] A. Zeckel, and J. J. van der Kolk, "A Comparative Intelligence Test of Groups of Children Born Deaf and of Good Hearing by Means of the Porteus Test," *American Annals of the Deaf*, LXXXIV (1939), 114–23.

[3] H. MacAndrew, "Rigidity and Isolation: A Study of the Deaf and the Blind," *Journal of Abnormal and Social Psychology*, XLIII (1948), 476–94.

[4] P. Oleron, "A Study of the Intelligence of the Deaf," *American Annals of the Deaf*, XCV (1950), 179–95.

[5] P. Oleron, "Conceptual Thinking of the Deaf," *American Annals of the Deaf*, XCVIII (1953), 304–10.

[6] H. R. Myklebust, and M. Brutten, "A Study of the Visual Perception of Deaf Children," *Acta Oto-Laryngologica*, Supplementum 105, (1953).

[7] Richard G. Brill, and James N. Orman, "An Experiment in the Training of Deaf Children in Memory Span for Sentences," *American Annals of the Deaf*, XCVII (1953), 270–279.

the visual memory of children severely deaf from early life would differ from that of children with normal hearing experience. In other words it was proposed that a severe deprivation in one sensory avenue, such as hearing, might influence the effectiveness of another sensory avenue, such as vision. This does not mean visual acuity as we think of it, but rather the mental activity which is stimulated by the act of seeing; in this instance, the memory for certain information presented visually.

The concept of sensory compensation is the assumption that a deficiency in one of the senses results in an increased ability in one or several of the other senses. As far as can be determined this assumption has not been subjected to direct experimentation, and it was the intent of this study at least partially to explore the matter.

Fifty-three deaf children ranging in age from seven years, six months to twelve years, six months were matched with an equal number of hearing children in terms of intelligence, age, and sex. Both groups were from residential schools and had similar socio-economic backgrounds. The Chicago Non-Verbal Examination was selected as being the most appropriate for comparing and matching the deaf with the hearing subjects.[8] The deaf children were so classified on the basis of audiometric records which demonstrated that none of them had hearing better than 70 decibels at 500 c.p.s. and 85 decibels at both 1000 and 2000 c.p.s. Eye defects in the children were not screened by instrumentation, but the presence of visual handicaps was noted by clinical observation. Doubtful cases were excluded from the study.

All of the subjects in the study were tested individually and in a special room set aside for the purpose. Approximately one hour was required to test each of the 106 children. For all tests suitable demonstration items were presented so that there was no question concerning the child's understanding of what he was expected to do.

The following items comprised the battery of visual memory tests employed: The Knox Cube test; Memory-for-Designs; an Object Location test; and four memory span

[8] A. W. Brown, *Manual of Directions for the Chicago Non-Verbal Examination*, (New York: The Psychological Corporation).

tests including Digit Span Forward, Digit Span Reversed, Picture Span, and Domino or Dot Pattern Span. Each test will be briefly described and the results presented.

The Knox Cube test has been a standard item on several intelligence test batteries for several years.[9] It employs four small black cubes which are placed one inch apart in a row before the subject. With a fifth identical cube the examiner taps each of the four cubes in a particular sequence, for example, touching the first one and then the third one and then the second one and so on. The subject must watch the series of taps, remember the sequence of movements and then duplicate what the examiner has done. The patterns of taps become increasingly difficult and the test is terminated when the subject fails to duplicate two successive patterns. One point is scored for each pattern correctly imitated. The relative success of the deaf and the hearing subjects was as follows:

TABLE 1

COMPARISON OF RESULTS ON THE KNOX CUBE TEST FOR BOTH THE EXPERIMENTAL AND CONTROL GROUPS

	Number	*Mean*	*S. D.*	*t score*	*F*
Experimental (Deaf)	53	7.83	1.39		
				2.11*	1.02
Control (Hearing)	53	7.30	1.89		

* t score is significant at 5% level of confidence. Value of F is not significant.

As Table 1 indicates, the deaf subjects were superior to the hearing subjects at the 5 per cent level of confidence on the Knox Cube test. The interpretations will be discussed collectively after all of the results have been presented.

The Memory-for-Designs test employed thirteen of the geometric figures from the Graham-Kendall test.[10] The designs were printed on white cards and each was exposed individually to the subject for two seconds. The card was

[9] H. A. Knox, "A Scale, Based on the Work at Ellis Island, for Estimating Mental Defect," *Journal of the American Medical Association*, LXII (1914), 741–47.

[10] F. K. Graham and B. S. Kendall, "Performance of Brain-Damaged Cases on a Memory-For-Designs Test," *Journal of Abnormal and Social Psychology*, XLI (1946), 303–314.

then removed and the subject reproduced the design from memory on a piece of paper. The original scoring plan of the Graham-Kendall test was not suitable for the purposes of this study since it does not allow for good differentiation among the types of subjects which were employed. A new scoring protocol was devised in which partial credit was allowed for the design reproductions. Great care was taken in the scoring plan so that subjects were not penalized for lack of artistic ability. Credit was given or denied on the basis of the various elements present, their juxtaposition and so on. The score varied with each design; the highest possible total score was fifty. The results of the Memory-for-Designs test were as follows:

TABLE 2

A Comparison of the Performances of the Experimental and Control Groups on the Memory-for-Designs Test

	Number	*Mean*	*S. D.*	*t score*	*F*
Experimental (Deaf)	53	33.31	8.98		
				2.80*	1.20
Control (Hearing)	53	28.18	9.86		

* t score is significant at the 1% level of confidence. Value of F is not significant.

Table 2 reveals a superiority on the part of the deaf subjects in Memory for Designs which reaches the 1 per cent level of statistical significance.

The Object Location test was a modification of a test designed by Morsh.[11] A large piece of white cardboard was demarcated into fifteen four inch squares. In each square was placed one common object familiar to each subject: a comb, a pencil, a key, and so on. The array of objects was then exposed to the subject for twenty seconds; then the objects were hidden from view and removed from the squares. In the next thirty seconds the subject was required to replace each object in its appropriate square. One point was given for each correct replacement.

The results are shown in Table 3.

The results demonstrate no significant difference between the two groups in performance on this test.

[11] J. E. Morsh, "Motor Performance of the Deaf," *Comparative Psychology Monographs*, XIII, No. 66 (1936).

TABLE 3

COMPARISON OF THE PERFORMANCES OF THE EXPERIMENTAL AND CONTROL GROUPS ON THE OBJECT LOCATION TEST

	Number	*Mean*	*S. D.*	*t score**	*F*
Experimental (Deaf)	53	9.02	3.70		
				.613	1.74
Control (Hearing)	53	8.62	2.80		

* t score and F value are not significant.

The materials for the Memory Span tests, that is, the digits, the pictures, and the domino patterns were imprinted in black on 2½″ by 3¼″ white cards. The four span tests comprising the series were administered to the subject in an identical manner, as follows: A double set of cards was used. One set was placed before the subject so that all of his cards were in view and the other set was used by the examiner for displaying the span sequences to be remembered. The initial span contained two stimuli; for example, the child was shown one card with a digit on it and then that card was placed face down and a second card was exposed to his view for the same length of time, approximately one second. The child's task was to remember the digits he had seen and in the correct order. He reported what he remembered by pointing to the corresponding cards which were lying face up before him. Thus, he did not have to report verbally. This technique was found suitable with the hearing children as well. Two spans of equal length were presented and if the child succeeded on both, the span was then increased to three, then to four, and so on. When a child failed on two spans of equal length, the test was terminated. The Digit Span, Picture Span, and Domino tests were all presented in this same way.

The child's performance was scored in two ways: First, the highest span which he remembered correctly was recorded "high span" score. Second, he was given additional points for the total number of shorter spans he had correctly reproduced up to the point at which the test was terminated. This accumulation of points was called his "weighted score" and was felt to be a more sensitive method by which to differentiate among the subjects. Thus, the results of the memory span tests will be reported in two ways:

First, the high span scores:

TABLE 4

COMPARISON OF HIGH SPAN RESULTS ON THE MEMORY SPAN TESTS FOR THE EXPERIMENTAL AND CONTROL GROUPS

	Digit Span Forward				
	N	*Mean*	*S. D.*	*t score*	*F*
Experimental (Deaf)	53	2.92	.977	9.94*	1.13
Control (Hearing)	53	4.75	.918		
	Picture Span				
	N	*Mean*	*S. D.*	*t score*	*F*
Experimental (Deaf)	53	3.47	1.23	3.95*	1.83†
Control (Hearing)	53	4.30	.911		
	Domino Span				
	N	*Mean*	*S. D.*	*t score*	*F*
Experimental (Deaf)	53	3.28	1.20	3.19*	1.29
Control (Hearing)	53	3.94	1.36		
	Digit Span Reversed				
	N	*Mean*	*S. D.*	*t score*	*F*
Experimental (Deaf)	53	3.15	1.23	3.43*	1.13
Control (Hearing)	53	4.00	1.31		

* t scores for high span are significant at greater than the 1% level of confidence.

† F value significant at the 1% level.

These data demonstrate that the hearing children were able to retain spans of significantly greater length than the deaf children and this superiority reached the 1 per cent level of significance for all four memory span tests.

The next Table shows the results of the "weighted scores" or the total span performance. The data revealed here too that the hearing children significantly outperformed the deaf children on all four memory span tests. This significance reached the 1 per cent level of confidence statistically.

Thus, the total results make it clear that the visual memory of deaf and hearing children as tested in this investigation does differ and that the direction of the difference depends upon the type of memory task involved.

TABLE 5

COMPARISON OF WEIGHTED SCORE RESULTS ON THE MEMORY SPAN TESTS FOR THE EXPERIMENTAL AND CONTROL GROUPS

	Digit Span Forward				
	N	*Mean*	*S. D.*	*t score*	*F*
Experimental (Deaf)	53	5.25	3.15	10.21*	2.24†
Control (Hearing)	53	13.18	4.69		
	Picture Span				
	N	*Mean*	*S. D.*	*t score*	*F*
Experimental (Deaf)	53	7.42	4.67	4.14*	1.50
Control (Hearing)	53	10.86	3.82		
	Domino Span				
	N	*Mean*	*S. D.*	*t score*	*F*
Experimental (Deaf)	53	6.25	4.48	3.49*	1.80
Control (Hearing)	53	9.84	6.01		
	Digit Span Reversed				
	N	*Mean*	*S. D.*	*t score*	*F*
Experimental (Deaf)	53	6.34	5.81	3.36*	1.10
Control (Hearing)	53	10.23	6.09		

* t scores for weighted score results are significant at greater than the 1% level of confidence.

† F value significant at the 1% level.

The contrast in the performances of the deaf subjects on these various memory tasks is provocative. Their inferiority on the memory span tests is most interesting. It is proposed that memory span, as it was measured in this investigation, involves the mental integration of a series of discrete yet related units into a meaningful sequence; that is, each digit, picture, or dot pattern exposed was a separate item, yet each had to be related to all of the other units in the span in order that the sequence could be accurately reproduced. Such a task may be construed as being a relatively abstract type of mental process. Deficiencies of the deaf in other measures of abstraction or conceptual thinking have been demonstrated by other investigators, notably Oleron and MacAndrew.[3, 4, 5] Much earlier Pintner and Paterson had found a similar deficiency in visual digit memory span on the part of the deaf and

concluded that it was due to their lack of auditory memory.[12] The importance of auditory imagery and verbalization has been demonstrated in learning experience.[13] The significance of the lack of these attributes cannot be underestimated.

The good performance of these same deaf subjects on the other memory tests of this investigation must then be explained. An analysis of the mental demands of the Knox Cube test, the Memory-for-Designs test, and the Object Location test reveals that they tend to involve a visual perceptual act rather than mental abstraction or conceptualization as do the memory spans. Thus, it is suggested that when given a learning or memory task on the *infra-conceptual* level the deaf child is able to achieve as well or better than the hearing child. The results here presented have indicated that the deaf were in fact **superior** to the hearing on the Knox Cubes and the Memory-for-Designs. This superiority is conceived of as being the result of a psychological compensatory phenomenon by which the deaf child becomes visually organized in specific ways in order to meet environmental demands.[14] This adaptiveness appears to be manifest in memory for movement (as in the Knox test) and memory for whole patterns of stimuli without reference to the parts making up the whole (as in the designs test).

Without going into detail it should be reported that statistical comparisons were made within the deaf group divided into three categories according to the etiology of the deafness. The three categories were Endogenous, Exogenous, and Undetermined. Differences in the performances of the three groups were found to be statistically insignificant, and it was concluded that the deaf are probably homogeneous in visual memory ability and that modifications in memory are due to the fact of deafness and not to its cause.

The whole question of differences between deaf and

[12] R. Pintner, and D. Paterson, "A Comparison of Deaf and Hearing Children in Visual Memory for Digits," *Journal of Experimental Psychology*, II (1917), 76–88.

[13] K. H. Kurtz, and C. I. Hovland, "The Effect of Verbalization During Observation of Stimulus Objects Upon Accuracy of Recognition and Recall," *Journal of Experimental Psychology*, XLV (1953), 157–64.

[14] Kurt Goldstein, *The Organism: A Holistic Approach to Biology* (New York: American Book Co., 1939).

hearing children in visual memory function seems important, especially in terms of its bearing on the educational achievement of the handicapped group. In order to explore at least one aspect of this factor, a reading achievement test was administered to 39 of the older deaf subjects in the sample. The measure of achievement chosen consisted of three subtests from the reading portion of the Coordinated Scales of Attainment.[15] These were scored according to criteria established by the authors, and the results demonstrated a retardation of the deaf subjects in age-grade level judged by hearing norms.

TABLE 6

INTERCORRELATIONS OF THE MEMORY TEST RESULTS AND THE COORDINATED SCALES OF ATTAINMENT READING ACHIEVEMENT SCORES

	READING SUB-TESTS		
	A	*B*	*D*
Knox Cubes	.41	.31	.04
Digit Span Forward	.68	.53	.30
Picture Span	.65	.70	.43
Domino Span	.54	.40	.47
Digit Span Reversed	.65	.47	.34
Memory-for-Design	.38	.33	.20
Object Location	.30	.39	.09

Pearson r required for significance, N = 39

1%	.393
5%	.304

This, of course, was the expected result and merely verified other research findings in this connection.[16] A correlational analysis of the reading and memory test scores was computed and the results are presented in Table 6.

For the deaf children all of the memory tests correlated to some degree with the reading achievement scores; but the four memory span tests—in other words, the tests on which the deaf subjects had performed in an inferior manner—correlated with the reading tests more significantly. It was inferred from these results that the deficiency of the deaf children in memory span and their retardationin reading may have a common basis psychologically.

[15] L. J. Brueckner, *et al.*, *Coordinated Scales of Attainment* (Minneapolis: Educational Publishers Inc., 1949).

[16] R. Pintner, J. Eisenson, and M. Stanton, *The Psychology of the Physically Handicapped* (New York: Appleton-Century-Crofts, Inc., 1941).

The findings of this investigation in general suggest that methods of educating the deaf child must recognize the differences in the way in which varying types of information are visually apprehended in the presence of a severe auditory deficiency. Teaching methods should take account of the limitations of deaf children in the memory span type of learning and perhaps capitalize on those aspects of visual memory in which the deaf child appears to have more capabilities.

Personality Characteristics of Rubella Deaf Children: Implications for Teaching of the Deaf in General

D. Marjorie Bindon, M.A.

Department of Psychology, Canterbury University College, Christchurch, New Zealand

In New Zealand many doctors, teachers of the deaf and parents of rubella deaf children consider that rubella deaf children differ in personality from children whose defective hearing was not caused by maternal rubella, as well as from hearing children. It is often asserted that the rubella deaf, in comparison with these other children, are more emotionally unstable; lack sustained, prolonged concentration on any one task; and commonly display illogical emotional outbursts and a marked unwillingness to co-operate in any activity which does not happen to interest them at that moment. Overseas literature contains many different and often contradictory opinions on the personality of the deaf in general, but the writer has found no separate reference to the personality traits of rubella deaf children. Thus there has been no available experimental evidence of emotional instability. Yet the idea that the rubella deaf may differ in some important respect from other deaf children is not confined to New Zealand. For instance, Murphy in discussing the intelligence test of four rubella deaf subjects states, "It is . . . of some interest that the maternal rubella cases are not, *as had been expected*, significantly below the Mean with respect to intelligence."[1]

The writer, a trained teacher of the deaf, has both taught and lived with deaf children. This experience led her to form the impression that the rubella deaf do not behave differently from other deaf children, but that irrespective of cause of deafness, *all* defective hearing children who have not naturally acquired speech and language are less developed cognitively, emotionally, and socially

[1] L. J. Murphy, "Assessment of Abilities of Deaf Children," (Unpublished Ph.D. thesis, Victoria University, Manchester, 1952).

than are hearing children of similar age and apparently similar intellectual endowment. It seemed that the cause of this immaturity is primarily, not deafness itself, but its inevitable consequence, a retardation in normal language development.

To test the above hypothesis, the writer carried out an experimental investigation into some personality characteristics of rubella deaf children. The experimental group contained 36 fifteen-year-old rubella deaf children born between December 1, 1938, and July 31, 1939. Two control groups were (1) 30 hearing children (non-deaf group) and (2) 15 children who were either born deaf from causes other than maternal rubella or had become deaf before they were two (non-rubella-deaf group). The children in these control groups were paired for sex, educational stream, age, and approximate socio-economic status (as gauged by parental occupation) with individuals from the experimental group. In equating the two deaf groups, the additional criterion of average degree of hearing loss (measured in the better ear by a pure tone audiometer in the frequencies 512, 1024 and 2048) was also used. All the deaf children tested (rubella and non-rubella) came into the Grade III category of classification and were still attending Government schools for the deaf in New Zealand where only the oral system of education has been in use. These schools are co-educational and admit both day pupils and boarders.

A personality test (Rorschach, using the Munroe Inspection Technique[2]), and two supporting tests 1) a performance intelligence test (Wechsler-Bellevue Intelligence Scale Performance Form II[3]), and 2) a fantasy production test (Make-a-Picture Story Test employing Shneidman's "formals"[4]) were given to all groups. These tests were chosen because they could easily be made into objective tests that would effectively eliminate the language handicap of the deaf subjects, and hence they appeared to be suitable

[2] Ruth L. Munroe, "The Inspection Technique for the Rorschach Protocol," *Projective Psychology*, Part III (ed. Abt & Bellah) (New York: Knopf, 1952).

[3] D. Wechsler, *The Wechsler-Bellevue Intelligence Scale, Form II: Manual for Administering and Scoring the Test* (N. Y.: The Psychological Corp., 1946).

[4] E. S. Shneidman, *Manual: Make A Picture Story Test*, Genetic Psychology Monographs 38 (1948).

and fair instruments for comparing the performances of deaf and hearing children.

On all aspects of the three tests, the two matched deaf groups gave markedly similar quantitative and qualitative results; and, as with the cause of deafness, neither degree of deafness, sex, nor the residential factor was found to have had any significant differential influence on their test performances ($P > .1$ in the few cases where quantitative differences warranted statistical analysis). That these tests did not discriminate within the deaf population is thus a confirmation of the writer's hypothesis of no behaviour difference between rubella and non-rubella deaf children.

Comparing now the *rubella group* with the *hearing group*, scores (both composite and several category scores) for both the personality and fantasy production test were significantly different (P at least $< .01$). There were also qualitative differences in performance. The Rorschach responses characteristic of the rubella deaf implied minimum intellectual, and perceptual, effort and organization. They were the responses typical of much younger children. In comparison with those of the matched normal-hearing children, the Make-a-Picture-Story findings for the rubella deaf revealed clearly their social isolation and illogical, unrealistic thinking. The performance intelligence test mean I.Q. score and mean subtest scores for the rubella deaf were all lower than those for the non-deaf group. That these differences were not significant ($P > .1$) may have been due to the small size of the groups. However, the consistently lower subtest findings for the rubella deaf do suggest that they may be less effective in comprehending and sizing up a total situation, in differentiating the essential from the inessential details and in visual analysis and synthesis. That is, the deaf may be less efficient in those thought functions of attention, anticipation, concentration, and judgment, which aid the individual in selecting and organizing his experiences effectively and hence help him to cope with his real life situation. The qualitative intelligence test results, together with the other test findings, all confirm the above interpretation of the conceptual processes of the rubella deaf.

The test results then verified the hypothesis that the rubella deaf perform no differently from non-rubella-deaf children. They revealed also that the deaf (rubella *and* non-rubella) perform differently from their hearing counterparts. But this finding is not taken as evidence to show that the deaf in general display more than their share of the personality traits that have commonly been assigned to them in the past: emotional instability, neuroticism, depression, and suspiciousness. Rather, the writer, from her practical experience with the deaf, suggests that the objective differences noted between the deaf and hearing subjects confirm her own particular hypothesis and indicate that the deaf as a whole are not "abnormal" but are undeveloped, or "subnormal" as Werner uses those terms. Thus the distinctive performances of the deaf in the present study can be regarded as outward manifestations of their lack of logical reasoning, and non-flexible, or undifferentiated behaviour. This last, Werner states, is the basic characteristic of immature (non-adult) organisms.[5]

It has already been mentioned that the writer does not think of the personality of the deaf in pathological terms. Nevertheless, the marked immaturity of the deaf that her test results show poses a problem for their teachers. All the children tested were of school leaving age, and, admittedly, all are capable of earning their own living. However, one may ask whether the schools for the deaf in their aim to educate their pupils to become economically independent citizens of a hearing society have done them full justice. In trying to achieve this utilitarian goal, the schools for the deaf have perhaps overlooked a more difficult, yet more worthwhile aim: that of trying to develop to the full the desirable potentialities of each child entrusted to their care. Have the schools for the deaf in their almost exclusive aim to provide their pupils with a "workable' vocabulary, which will enable them just to 'get by' in a hearing society, side-stepped their obligation and sacrificed their chances to make each deaf child "a well balanced happy *deaf* person"? The present finding of immaturity

[5] H. Werner, "Abnormal and Subnormal Rigidity," *Journal AbSocPsych* (1946), 41: 15–24; and "The Concept of Rigidity: A Critical Evaluation," *PsychRev* (1940), 53: 43–52.

in the deaf suggests, therefore, that if the psychological well-being of each pupil is to be the primary consideration of educators of the deaf, they will have to face the problem of whether their present teaching emphasis and techniques not only may be inadequate for achieving this purpose, but may actually prevent its attainment.

According to Piaget, it is through social intercourse that the diffuse, jumbled thinking of the young normal child gradually becomes realistic and logical. Hence "socialization," or "socialized learning," is indispensable for complete conceptual development. If this process is restricted, the cognitive, emotional, and social development of the child will likewise be retarded. Piaget further considers that language is the main factor in the formation of this "progressive socialization" of the child which is so essential if "ego-centrism" is to be replaced by a capacity for "social intercourse," "co-operation" and "decentration of thinking." This last, he maintains, is a necessary prerequisite for truly logical reasoning. Thus full personality maturation appears impossible without normal language development.[6]

The extreme environmental impoverishment of the wordless pre-school deaf child has probably set rather narrow ultimate limits to his future cognitive development. This does not mean, however, that one can discount the factor of formal education in influencing the deaf's psychological maturation. Experimental evidence indicates that in the development of concept formation, degree of intelligence is not as important as training or experience, of which one chief component seems to be vocabulary.[7] Moreover, recent experiments demonstrate the influence of specific learning experiences on the development, or non-development, of rigid behaviour.[8] Thus, although the pre-school environment of the deaf child will probably prevent him from reaching complete psychological maturation, it will largely be the scholastic environment that will

[6] J. Piaget, *Play, Dreams, and Imitation in Childhood*, Part III (London: Heineman, 1951).

[7] W. E. Vinacke, "The Investigation of Concept Formation," *PsychBull* (1951), 48: 1–31.

[8] A. H. Buss, "Some Determinants of Rigidity in Discriminant-Reversal Learning," *Journal ExpPsych* (1952), 44: 222–227; also Schroder and Rotter, "Rigidity as Learned Behaviour," (1952) 44: 141–150.

determine how far he can develop within his restricted limits. Therefore, "All other things being equal, the mental and emotional development of such a child may be considered a singular reflection of the quality and effectiveness of the educational (school) forces concentrated upon him."[9]

Mention has already been made of the crucial relationship between language development and full mental development. But, as Doctor states, ". . . aside from teaching the deaf-blind, the teaching of the deaf child is the most difficult job in the field of teaching . . . (and) the teaching of language is even more difficult than the exhausting job of teaching him speech."[10] The writer realizes only too well how difficult it is to impart language to the deaf child. Nevertheless, she feels that teachers of the deaf could do more to develop and exercise the higher thought processes of their pupils. "Unimpaired thinking in persons of average intelligence is marked among other things by the employment of abstract concepts."[11] But it is these abstract concepts which the deaf find so very hard to achieve. The following statement by Helen Keller exemplifies this point: "I have found deafness to be a much greater handicap than blindness. In advancing years I have grown much closer to the deaf because I have come to regard hearing as the key sense, since it is definitely harder for the deaf to grasp concrete facts, much less ponder on the abstract."[12] Because the deaf find it extremely difficult to grasp abstract concepts, their teachers have tended to impart *all* information to them in a concrete form, at a factual, utilitarian level. This practice should be discontinued if the deaf are ever to achieve "unimpaired thinking". Instead, their teachers should always be ready to utilize, and also create, experiences that will help them to formulate abstract ideas, and then to give them the *abstract terminology* to express those ideas.

[9] Edna Simon Levine, *An Investigation into the Personality of Normal Deaf Adolescent Girls*, (Ph.D. thesis, N. Y. Univ., 1948; Univ. Microfilms, Ann Arbor, Mich., Pub. No. 1156), p. 14.

[10] Powrie V. Doctor, "On Teaching the Abstract to the Deaf," *The Volta Review* (Dec. 1950), 547–49.

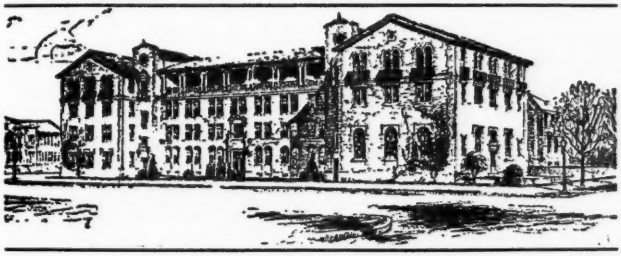
[11] L. S. Hearnshaw, "The Psychological Study of Conceptual Thinking,' British Journal of Psychology (1954), 45: 1–6.

[12] Quoted by Doctor, *op. cit.*

It is suggested then, that the main concern of educators of the deaf should not be merely to equip the deaf child with sufficient knowledge to ensure his economic independence. They should aim also to make him a mature, well-integrated individual. To do this, they will have to give far more attention to this matter of teaching the abstract to the deaf, and to the ever present problem of how to provide them with a wide variety of situations and experiences which will continually stimulate, exercise, and develop their conceptual processes and capabilities.

To sum up: An experimental investigation by the writer showed that the test performances of the rubella deaf sample could not distinguish them from non-rubella-deaf children. However, as a group, the deaf subjects (rubella *and* non-rubella) revealed that, in comparison with their hearing counterparts, they were functioning at a less mature level. It was contended that their arrested personality development resulted from deafness retarding normal language development. This retardation, in its turn, had hindered "progressive socialization," an essential condition for full personality development. It was suggested also that through more efficient teaching, educators of the deaf may be able to help their pupils to reach a higher level of personality integration.

THE Language Outline prepared by the members of the faculty at Central Institute for the Deaf, St. Louis, Mo., has been reprinted for the third time since it was originally published in the AMERICAN ANNALS OF THE DEAF in September, 1950. Copies may be obtained for fifty cents. Orders may be sent to the AMERICAN ANNALS OF THE DEAF, Gallaudet College, Washington 2, D. C.



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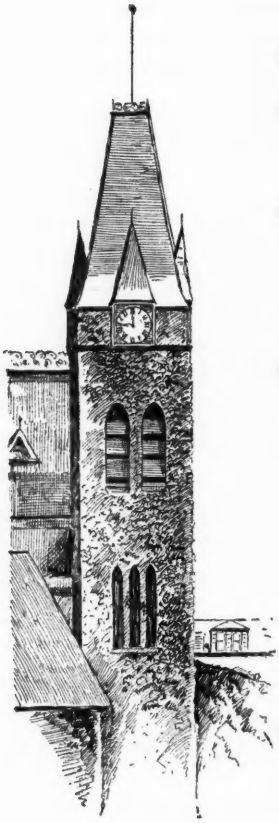

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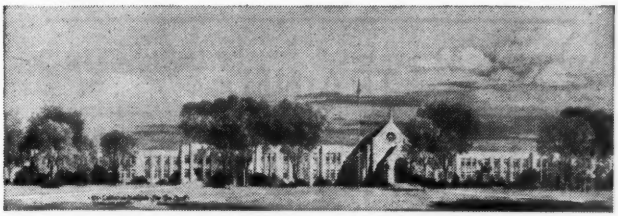

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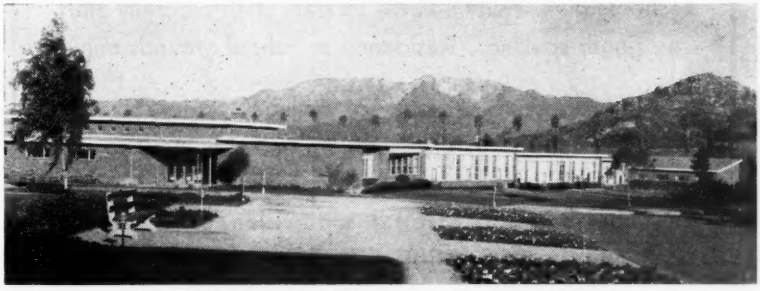

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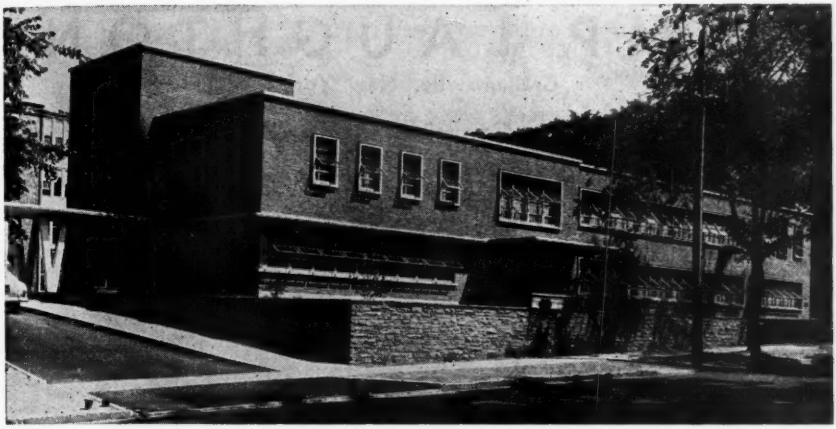

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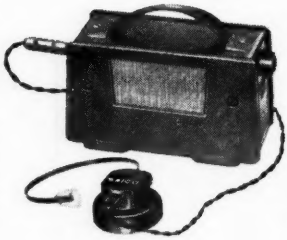

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THE CONVENTION OF AMERICAN INSTRUCTORS OF THE DEAF

Information concerning membership in the Convention of American Instructors of the Deaf may be obtained from the Treasurer of the Convention, Thomas Dillon, New Mexico School for the Deaf, Santa Fe, New Mexico. Annual membership dues are $2.00. All teachers of the deaf in the United States and Canada are eligible for membership. Members of the Convention receive a copy of the printed *Proceedings* of the Convention of American Instructors of the Deaf. Those desiring subscriptions to the *American Annals of the Deaf* should write to the Editor, Gallaudet College, Washington 2, D. C. The yearly subscription rate is $4.00.

Back Issues of the Annals Wanted

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October, 1870
April, 1892
January, 1895
April, 1895
January, 1906
September, 1906
September, 1907
January, 1908
May, 1909
September, 1909
November, 1909
May, 1910
May, 1912
September, 1915
January, 1953
September, 1953
September, 1954
September, 1955
March, 1956
January, 1957

The American Annals of the Deaf

The AMERICAN ANNALS OF THE DEAF was founded in 1847 at the American School for the Deaf in Hartford, Connecticut, by the members of the faculty of that school, which is the first free public school for the deaf in America. Although the journal received the approval of the administrative school authorities, the periodical was first entirely sponsored by the members of the faculty. After two years the ANNALS was discontinued for some months but was revived by the members of the Convention of American Instructors of the Deaf in their first meeting in New York, N. Y., in 1850.

In April, 1861, the publication ceased because of the War Between the States, inasmuch as the membership of the Convention was made up of northerners and southerners in almost equal proportion. In September, 1868, the AMERICAN ANNALS OF THE DEAF resumed publication with the editorial offices on Kendall Green, in Washington, D. C., where it has since remained.

The AMERICAN ANNALS OF THE DEAF is the official organ of the Conference of Executives of American Schools for the Deaf, which was organized in 1868, and of the Convention of American Instructors of the Deaf, founded in 1850. According to the Library of Congress it is the oldest educational publication in the United States still in existence. It is also the oldest journal on the education of the deaf in the world.

The ANNALS is published five times a year, being issued in September, November, January, March, and May. The subscription price is $4.00 a year, payable in advance. If five or more copies of the ANNALS are sent to one address, the subscription price is $3.50 a year. Single numbers sell for seventy-five cents, except for the January number which sells for $2.00. Back issues are available for 1847, 1848, 1849, 1857, and from September, 1868, to the present. Indexes for 1847–1875, 1876–1885, 1886–1895, 1896–1905, are available at $2.00 each. Indexes for 1906–1915, 1916–1925, 1926–1935, 1936–1945, 1946–1955, were issued as regular numbers of the ANNALS. All back issues prior to 1940 sell for $1.00 each. All requests for subscriptions or for back numbers should be addressed to Editor, AMERICAN ANNALS OF THE DEAF, Gallaudet College, Washington 2, D. C.

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FOUNDED 1868

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FOUNDED 1850

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